



Features

- $V_{DS} = -20V, I_D = -3A$   
 $R_{DS(ON)} = 120m\ \Omega @ V_{GS} = -2.5V$  (Typ)  
 $R_{DS(ON)} = 85m\ \Omega @ V_{GS} = -4.5V$  (Typ)
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

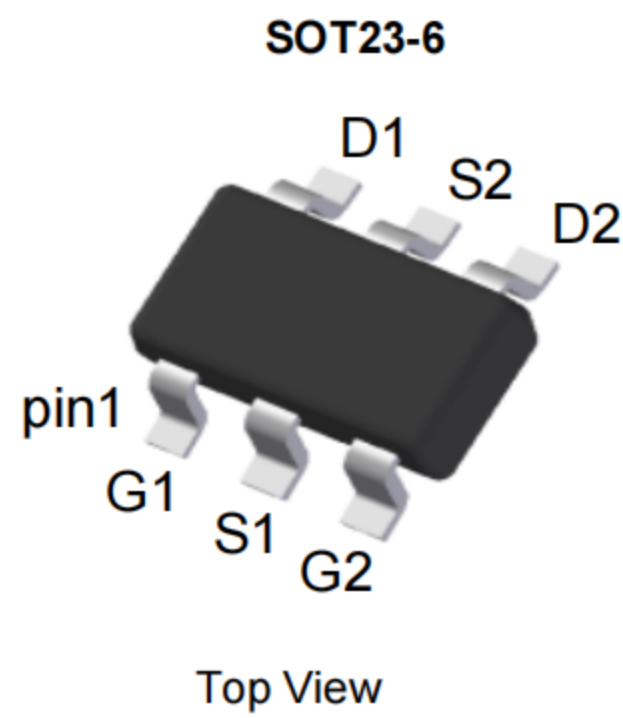
Application

- PWM applications
- Power management

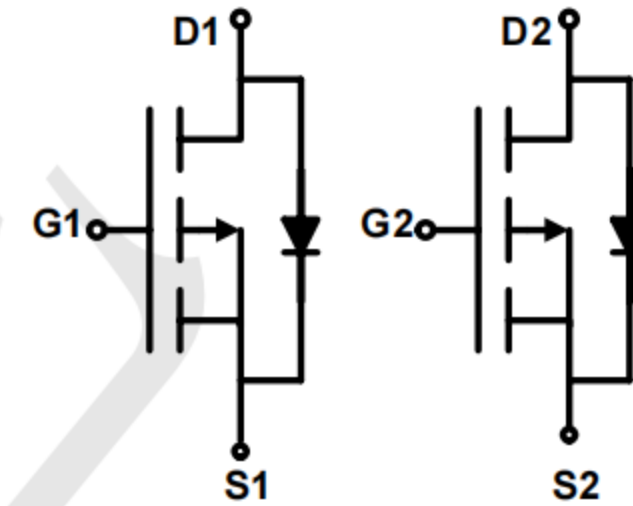
Ordering Information

- Package: SOT23-6
- Shipping Qty: 3000/7inch Tape Reel

Package and Pin Configuration



Circuit diagram



Marking: 312F

ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

TECH PUBLIC Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D$	-3	A
	$I_{DM}$	-10	A
Maximum Power Dissipation	$P_D$	1.1	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	110	°C/W
--	-----------------	-----	------



**ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1	$\mu A$	
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA	
<b>ON CHARACTERISTICS (Note 3)</b>							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5		-1	V	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3A$		85	100	m $\Omega$	
		$V_{GS}=-2.5V, I_D=-2A$		120	150		
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-3A$		7		S	
<b>DYNAMIC CHARACTERISTICS (Note4)</b>							
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V, F=1.0MHz$		300		PF	
Output Capacitance	$C_{oss}$				65		PF
Reverse Transfer Capacitance	$C_{rss}$				50		PF
<b>SWITCHING CHARACTERISTICS (Note 4)</b>							
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A, V_{GS}=-4.5V, R_{GEN}=6\Omega$		12		nS	
Turn-on Rise Time	$t_r$			15		nS	
Turn-Off Delay Time	$t_{d(off)}$			80		nS	
Turn-Off Fall Time	$t_f$			45		nS	
Total Gate Charge	$Q_g$	$V_{DS}=-10V, I_D=-3A, V_{GS}=-4.5V$		6		nC	
Gate-Source Charge	$Q_{gs}$			1		nC	
Gate-Drain Charge	$Q_{gd}$			2.4		nC	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>							
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-1.25A$			-1.2	V	



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

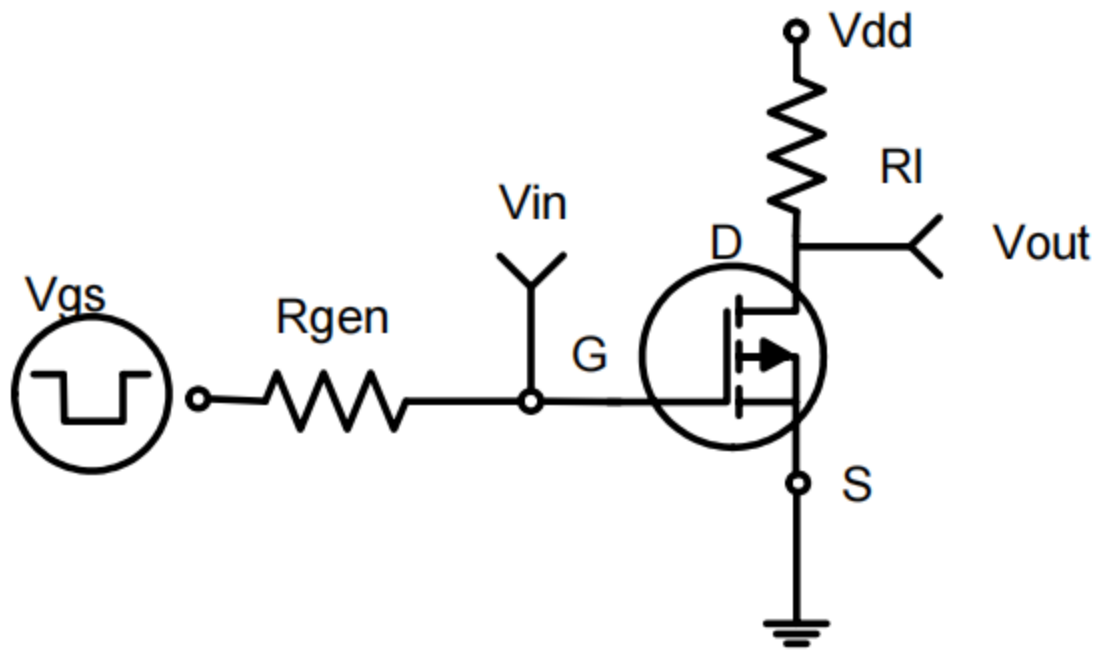


Figure 1: Switching Test Circuit

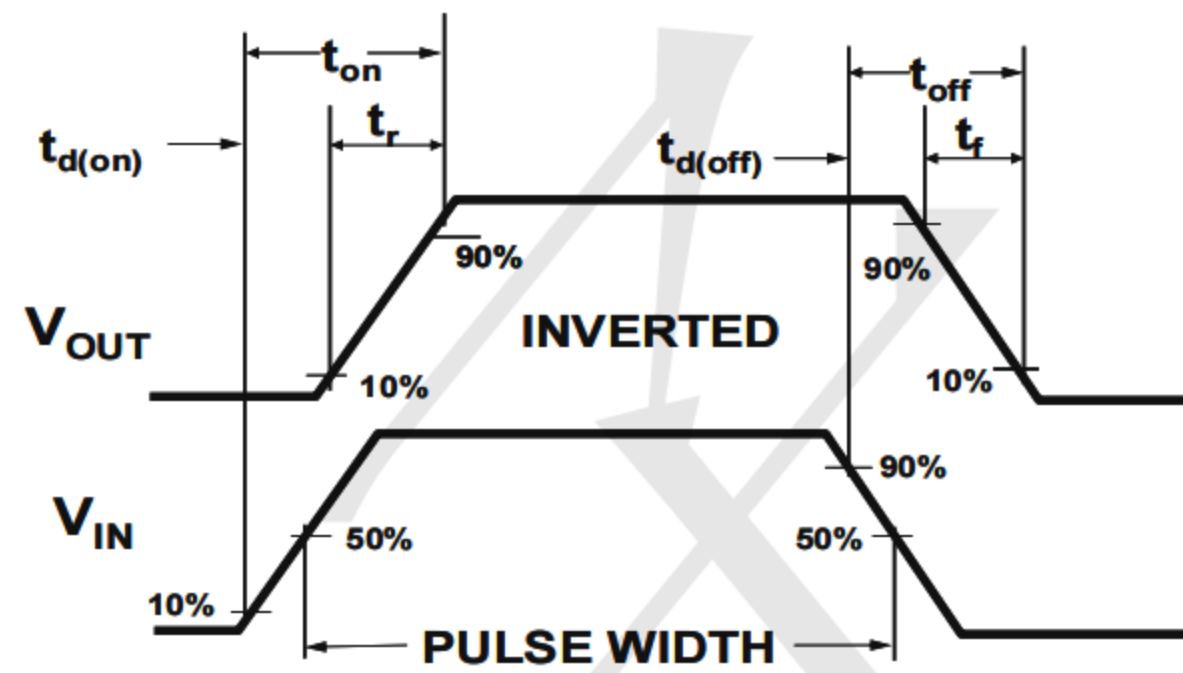


Figure 2: Switching Waveforms

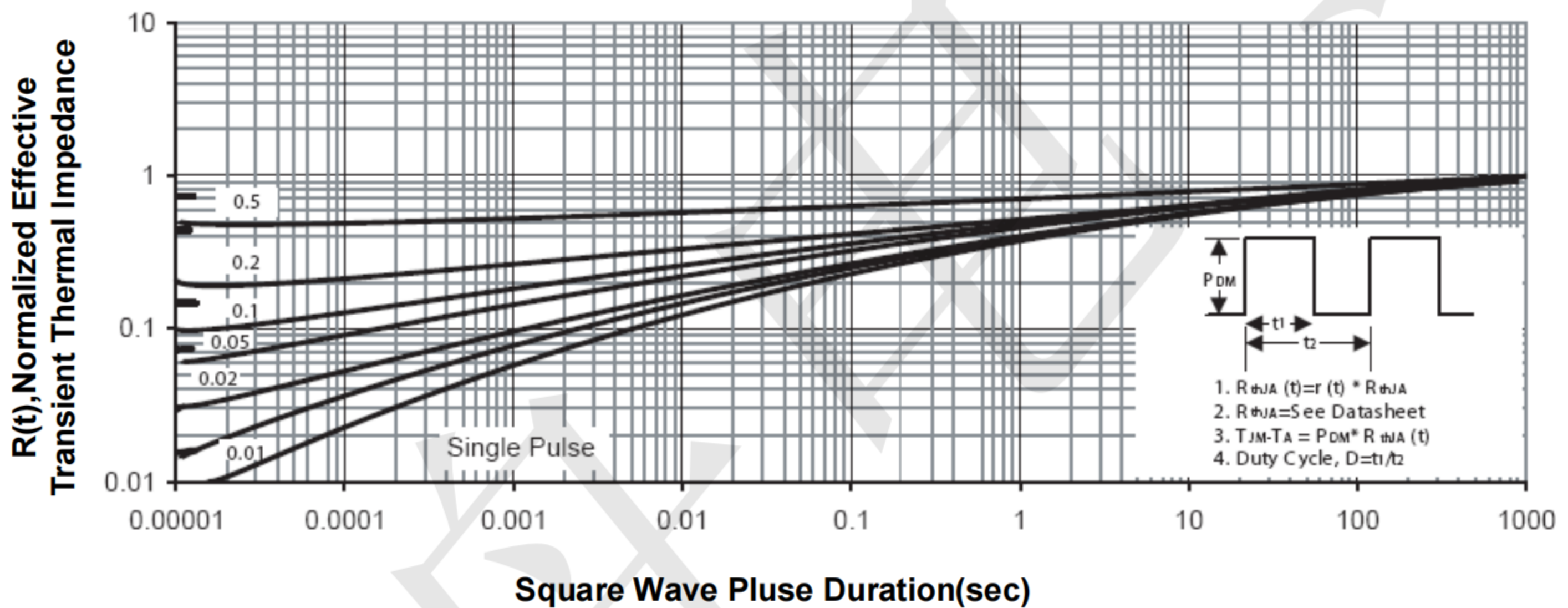
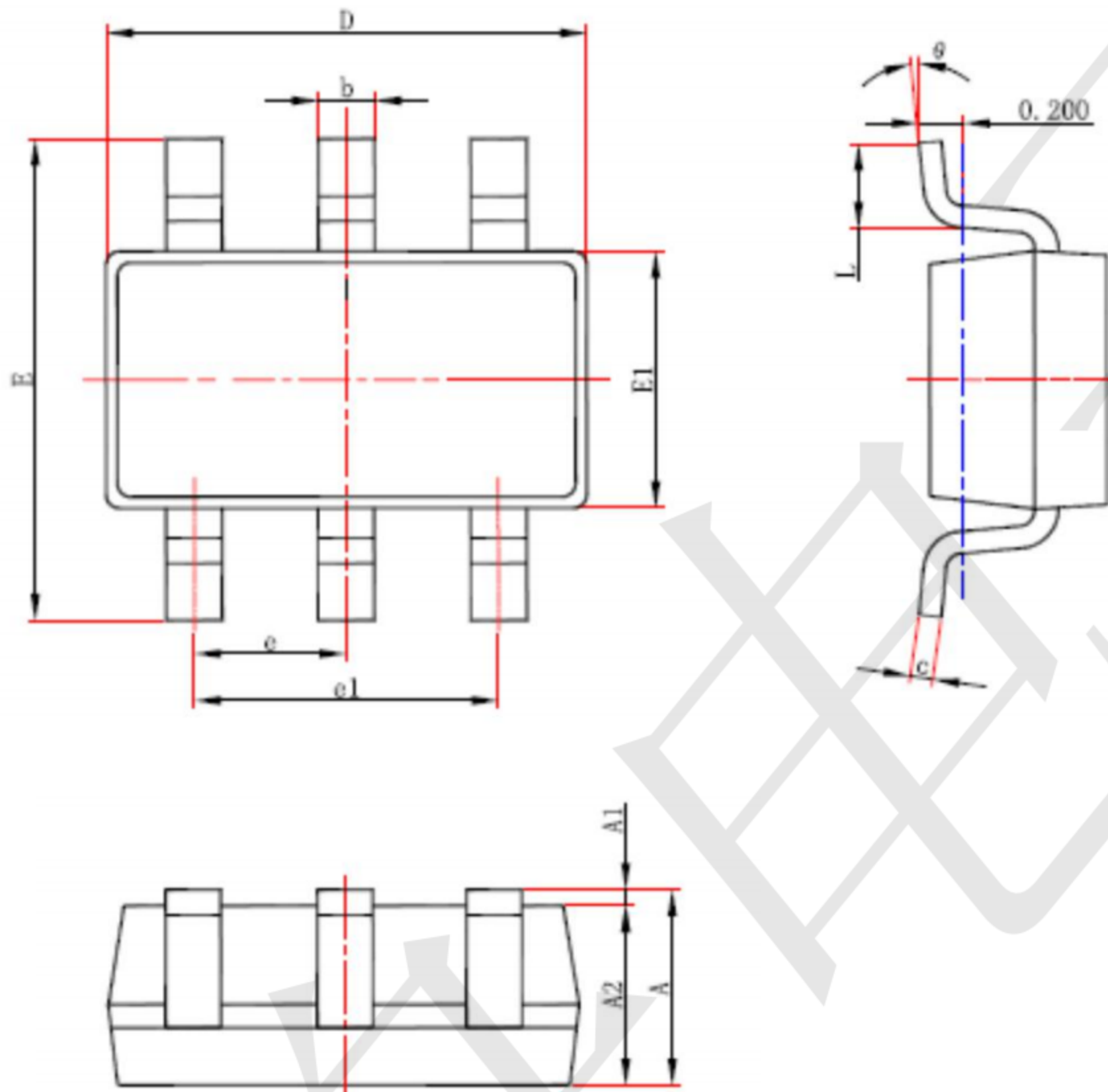


Figure 3: Normalized Maximum Transient Thermal Impedance



SOT23-6 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°